

## WHAT IS CLAIMED IS:

1. An Eco-Driving diagnostic system comprising:

a vehicle;

a center;

a user terminal;

5 a network; and

a radio communication network; wherein:

the vehicle includes a vehicle sensor, an in-vehicle device, a radio communication terminal, wherein:

the in-vehicle device acquires information about at least  
10 the number of engine revolutions, fuel consumption, vehicle speeds, vehicle positional information and time information from the vehicle sensor, and temporarily processes the acquired data for subsequent use; and

the radio communication terminal transmits the  
15 information to the center via the radio communication network, and receives information from the center;

the center includes a communication control device, a management server, a database, a mail server, and a Web server, wherein:

20 the communication control device in the center transmits and receives the information to and from the radio communication terminal in the vehicle;

the management server:

25 manages the information transmitted from the vehicle;

calculates, on the basis of the managed information, at least fuel consumption and environmental-load emissions with respect to each event and corresponding to a total of events for a total driving time of the vehicle;

30 stores in the database the calculated information  
 with user information;  
 retrieves the information stored in the database;  
 processes the retrieved information into contents  
 for diagnosis and advices by combining and comparing the information;  
 35 provides the contents from the mail server to the  
 user terminal via the network; and  
 provides the contents from the Web server to the  
 user terminal via the network; and  
 the user terminal:  
 40 is a mobile terminal or a personal computer;  
 sets up at least personal information, timing of  
 providing the contents, and detail of the contents;  
 displays the contents; and  
 informs with sound.

2. An Eco-Driving diagnostic system as claimed in claim 1, wherein the radio communication terminal includes a displaying section to display information from the center.

3. An Eco-Driving diagnostic method comprising the steps of:  
 turning on a power source of an in-vehicle device when an engine of a vehicle is started up;

acquiring from a vehicle sensor, by the in-vehicle device,  
 5 information necessary to comprehend driving statuses including at least  
 engine revolutions, fuel consumption, vehicle speeds, vehicle positional  
 information, and time information from the start of the engine;

temporarily processing, by the in-vehicle device, the acquired  
 information so as to identify at least fuel consumption with respect to  
 10 each event and environmental-load emissions due to the fuel

consumption;

transmitting the processed information from a radio communication terminal in the vehicle to a communication control device in a center via a radio communication network;

15       calculating, by a management server, the information received at the center to obtain at least fuel consumption and environmental-load emissions due to the fuel consumption with respect to each event or for a total driving time;

20       storing in a database the calculated information being associated with respective users and vehicles;

processing, by the management server, the information stored in the database into contents including at least results obtained by comparing the fuel consumption and environmental-load emissions due to the fuel consumption with respect to each event and for a total driving  
25       time with those of the other vehicles, and breakdowns of the environmental-load emissions with respect to each event;

finding out at least an event causing increases of fuel consumption and environmental-load emissions on the basis of the breakdowns:

30       creating contents including results of diagnosis and advices to urge a user to drive in such a way as to reduce the fuel consumption and the environmental-load emissions;

transmitting the created contents from a mail server in the center to a user terminal at its e-mail address; and

35       providing the created contents to the user terminal via a Web server through a network; wherein:

the in-vehicle device is connected to the vehicle sensor via a wire line and short-range wireless communication system, respectively.

4. A business system utilizing an Eco-Driving diagnostic

system as claimed in claim 1, wherein:

the user terminal is a terminal of a company which is required to reduce fuel consumption of the vehicle;

5 the vehicle is a vehicle of the company; and  
the center:

is a center of a traffic ESCO;

manages information about a fuel cost reduced by receiving services from the Eco-Driving diagnostic system at the vehicle;

10 informs the user terminal of the reduced fuel cost; and  
receivers a part of the reduced cost as a reward.

5. A business system utilizing an Eco-Driving diagnostic system as claimed in claim 1, wherein:

the user terminal is a terminal of a company which is required to reduce environmental-load emissions from the vehicle;

5 the vehicle is a vehicle of the company; and  
the center:

is a center of a traffic ESCO;

manages information environmental-load emissions reduced by receiving services from the Eco-Driving diagnostic system at  
10 the vehicle;

informs the user terminal of the emission reductions; and  
receives a part of excess emissions as a reward when the emission reductions are below an assigned amount.

6. A business system utilizing an Eco-Driving diagnostic system as claimed in claim 1, wherein:

the user terminal is a terminal of a company which is required to reduce environmental-load emissions from the vehicle;

5 the vehicle a vehicle of the company; and

the center:

is a center of an independent organization for accrediting environmental-load emissions dealt in emissions trading;

manages information about environmental-load  
10 emissions reduced by receiving services from the Eco-Driving diagnostic system at the vehicle;

accredits environmental-load emissions dealt in the emissions trading on the basis of the managed information;

informs the user terminal of the environmental-load  
15 emissions; and

receives a commission in reward for the accreditation.

7. A business system utilizing an Eco-Driving diagnostic system as claimed in claim 1, wherein:

the user terminal is a terminal of an Eco-Driving route information service receiver which requires Eco-Driving route  
5 information;

the vehicle is an Eco-Driving diagnosed vehicle;

the center:

is a center of a company of an Eco-Driving route information service provider;

10 manages original information about environmental-load emissions and fuel consumption to create an Eco-Driving route, the information being acquired by receiving services from the Eco-Driving diagnostic system at the vehicle;

comprehends a gap in fuel consumption and  
15 environmental-load emissions between different driving routes on the basis of the original information and the information acquired from the vehicle sensor of a plurality of the vehicles;

determines a driving route with less fuel consumption

and less environmental-load emissions;

20                      informs the user terminal of the determined information;  
and

                         receives a value for the services; and  
                         the Eco-Driving diagnosed vehicle receives a value for  
providing the original information from the center.

8. A business system utilizing an Eco-Driving diagnostic  
system as claimed in claim 1, wherein:

                         the user terminal is a terminal of a toll charging service  
provider for charging a toll on a tollway according to environmental-load  
5    emissions;

                         the vehicle is an Eco-Driving diagnosed vehicle; and  
                         the center:

                         is a center of the toll charging service provider;  
                         manages information about environmental-load  
10    emissions on the tollway, the information being acquired by receiving  
services from the Eco-Driving diagnostic system at the vehicle;

                         informs the user terminal of the environmental-load  
emissions;

                         takes off a toll when the environmental-load emissions is  
15    below a stipulated value; and

                         charging a penalty toll when the environmental-load  
emissions exceed the stipulated value.

9. A business system utilizing an Eco-Driving diagnostic  
system as claimed in claim 6, wherein:

                         the vehicle is a vehicle of a user of the Eco-Driving diagnostic  
services; and

5                      another company purchase emission reductions of

environmental loads from the user.

10. A business system utilizing an Eco-Driving diagnostic system as claimed in claim 7, wherein the center transmits the determined driving route to the radio communication terminal in the vehicle.